

ABSTRACT OF THE DISCLOSURE

A device for calculating numerical solutions for partial differential equations in successive intervals using adaptive meshes, comprises: a neural network part for producing predictions of gradients at a following interval based on gradients available from previous intervals, and a mesh adaptation part, associated with said neural network part, configured for adapting a mesh over a domain of a respective partial differential equation using said predictions, such that said mesh adaptively refines itself about emerging regions of complexity as said partial differential equation progresses over said successive intervals. The neural network part succeeds in its predictions since its use herein is equivalent to using time series function fitting techniques.